MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A.
There were two goals to this project. The first was to generate new strains of Drosophila melanogaster which would be instrumental in the molecular analysis of a gene which is essential for normal development of the nervous system as well as for normal neural function. The second goal was to provide a training opportunity for American Indian students by involving them in the research. Both goals were reached.

1. X-ray mutagenesis and selection of new mutants at the shibire locus.

Over 40,000 progeny of a mating between X-irradiated males and virgin females which carried an extant temperature-sensitive allele of the shibire mutation, were screened for paralysis at 29°C. After retesting putative new mutants and creating balanced strains, five new mutants were recovered. Most importantly, two strains had genetic rearrangements involving site 14A1 on the X chromosome, the site of the shibire locus. The importance of these strains lies in their providing a physical marker of the gene on the DNA. Thus, molecular clones which span the breakpoint will identify the gene. Furthermore, we have from another lab a cosmid which contains DNA from near the breakpoint on the second chromosome. This may facilitate a "jump" as one cloning procedure. These experiments are in progress.

2. P-factor mutagenesis.

Transposon tagging using P-factor mutagenesis and retrieval of P-containing clones from a library generated from the strain is potentially a quick and efficient way to clone a gene. We screened over 80,000 progeny from a hybrid dysgenesis cross with an extant shibire mutation and after the appropriate genetic tests recovered three new P-mutants. If these prove to have P inserts at 14A1 (determined by in situ hybridization with labeled P probes) we will proceed to make a genomic library in phage lambda. Phage that are identified by labeled P probes (p 25.1, kindly provided by G. Rubin, U.C. Berkeley) will be tested for hybridization to 14A1 on the X chromosome. A positive clone will provide the DNA for a probe of a Maniatis genomic library. These experiments are in progress.

Involvement of American Indian Students.

By using funds provided by the campus as part of a cost sharing agreement and by stretching the project over two summers, we were able to include two American Indian undergraduate students. Raymond Padilla, then a student at Ft. Lewis College at Durango, Colorado, participated in the first screen for new mutants in the summer of 1985. Theresa Crawford, a student at The University of New Mexico, participated in the research during the summer, 1986. Both students gained a great deal from the experience and both have indicated an interest in pursuing graduate studies.